

## CLAIMS

1. A titanium alloy part having a compressive stress of approximately 270 MPa or more within a depth of about 100  $\mu$  m  
5 from a surface thereof.

2. The titanium alloy part of claim 1, further comprising a surface region extending from the surface to a depth of about 100  $\mu$  m, and an internal region disposed  
10 internally relative to the surface region, wherein the surface region includes a modified layer containing more  $\alpha$  phase than does the internal region, the modified layer accounting for a proportion of about 10 vol% or less of the surface region.

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3. The titanium alloy part of claim 1 or 2, wherein the surface has a maximum surface roughness  $R_t$  of about 20  $\mu$  m or less.

20 4. The titanium alloy part of any of claims 1 to 3,

wherein the titanium alloy part contains about 50 vol% or more of  $\beta$  phase at room temperature.

5. The titanium alloy part of any of claims 1 to 4,  
5 wherein the titanium alloy part is a spring.

6. The titanium alloy part of any of claims 1 to 4,  
wherein the titanium alloy part is a suspension spring for a  
vehicle.

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7. The titanium alloy part of any of claims 1 to 4,  
wherein the titanium alloy part is one selected from the  
group consisting of a valve spring for an engine, a  
connecting rod for an engine, and a structural part for an  
15 aircraft.

8. An engine comprising the titanium alloy part of any  
of claims 1 to 4.

20 9. A vehicle comprising the titanium alloy part of any

of claims 1 to 4.

10. A method for producing a titanium alloy part comprising:

- 5        step (A) of providing a shaped titanium alloy part;
- step (B) of subjecting the shaped titanium alloy part to a shot peening using a first shot medium; and
- step (C) of mechanically or physically removing at least a part of a modified layer created in a surface region of the
- 10    shaped titanium alloy part as a result of step (B).

11. The method for producing a titanium alloy part of claim 10, wherein step (C) comprises shooting a second shot medium against a surface of the shaped titanium alloy part,

15    the second shot medium having a higher hardness than that of the first shot medium.

12. The method for producing a titanium alloy part of claim 11, wherein the second shot medium has a Vickers

20    hardness of about 1,000 or more.

13. The method for producing a titanium alloy part of claim 11 or 12, wherein the second shot medium contains SiO<sub>2</sub>.

5        14. The method for producing a titanium alloy part of any of claims 10 to 13, wherein step (C) removes the shaped titanium alloy part at a depth of about 20 μm to about 40 μm from the surface.

10       15. The method for producing a titanium alloy part of any of claims 10 to 14, wherein the shaped titanium alloy part has a Vickers hardness of about 370 to about 470.

16. The method for producing a titanium alloy part of  
15 any of claims 10 to 15, wherein step (A) comprises:

step (A1) of winding around a wire material of a titanium alloy to obtain a shaped titanium alloy part having a coil shape; and

step (A2) of subjecting the shaped titanium alloy part  
20 to an aging treatment.

17. The method for producing a titanium alloy part of  
any of claims 10 to 16, wherein step (B) comprises shooting  
the first shot medium against the shaped titanium alloy part  
5 via centrifugal force, compressed air, or hydraulic pressure.